SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

Until the Cows Come Home

Improving dairy herds and products.

The U. S. Department of Agriculture (USDA) and Land-Grant university research and extension are helping producers improve profitability, provide a safe milk supply and give consumers more choices in dairy products. Research done today will enable producers to respond to future market trends. Shoppers are buying more low-fat dairy products, and low-fat milk might one day come directly from the cow.

Payoff

- **Two-percent cows.** While low-fat (2 percent fat or less) milk consumption has increased from 22 to 62 percent of the total fluid milk market during the past 20 years, the fat content of raw fluid milk produced by dairy cows remains virtually unchanged. **Maryland** researchers have determined that trans-fatty acids are responsible for reducing the fat content in cow's milk. Since consumer demand for fat in all foods, including dairy products, has been decreasing, developing practical procedures to reduce milk's fat content would eliminate the cost of removing the fat later and give consumers the low-fat products they want.

- **One on one education.** Dairy management plans designed by **North Dakota State** Extension are tailored to individual producers and their production systems and limitations. One farm increased dairy income by $7,200 in its first month in the program. Balancing herd rations, improving feed bunk management and monitoring production helped increase annual income by more than $86,000. On another farm, two months of ration changes and timely nutrition monitoring resulted in seven pounds per day per cow of additional milk, adding $1,800 per month in income.

- **The key to obesity?** Skim milk, low-fat yogurt and cheese may help reduce body fat, especially in women. This is good news, especially for the 97 million Americans who are overweight. A **Tennessee** study shows that calcium in low-fat dairy foods triggers a hormonal response that inhibits the body's production of fat cells and boosts breakdown of fat. The study found that women who consumed the most low-fat dairy products were 80 percent less likely to be obese.

RESEARCH, EXTENSION AND EDUCATION AT WORK

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- **Slow down the breakdown.** Milk contains plasmin, an enzyme that breaks down proteins. Plasmin helps cheese ripen faster and taste better, but it also can degrade milk products or products that contain whey from milk. **Purdue** researchers are isolating two enzyme inhibitors naturally present in milk that might control plasmin activity. By controlling plasmin, food processors may make tastier cheese and higher quality bakery products, meat and nutritional beverages. They may also lower production costs for those products.

- **Herd mentality. Utah State** Extension helped dairy farmers earn more per cow per year by implementing scientifically balanced rations through the Dairy Herd Improvement Association (DHIA). Cows in the program produced about 6,000 pounds more milk per year than non-DHIA cows. At current milk prices, that amounts to about $1,000 more per cow, or more than $15 million for the 116 Utah DHIA herds.

- **Bacterial defenders.** The growth and metabolic activities of bacterial cultures are vital in making foods such as cheese. Many bacterial cultures are susceptible to attack by viruses. Such attacks can lead to product losses, safety concerns and spoilage. **North Carolina State** researchers developed a system to defend bacteria from viruses. It traps and destroys new viruses as soon as they appear in fermentation environments. The cultured dairy product industry has already implemented this system in manufacturing cottage cheese and hard cheeses in some North American plants.

- **New markets for byproducts.** Cheese makers produce 90 pounds of whey for every 10 pounds of cheese they make. An important source of milk nutrients, whey is now widely incorporated into food, usually as a relatively inexpensive ingredient. Identifying higher-valued products from whey could benefit producers, processors and consumers. **Wisconsin** food scientists developed an ion exchange process to isolate valuable proteins from whey. Successes include: Lactoferrin, a protein that enhances the body's ability to fight infections and that could be added to infant formula to help babies absorb more iron, and glycomacropeptide, a potentially rich source of protein important for the one in 10,000 Americans with PKU disease. Lactoferrin is worth more than $135 per pound and glycomacropeptide more than $30 per pound.

- **Younger mothers.** Reducing the time needed to raise a heifer to calving age can save dairy farmers money. **Wisconsin** dairy scientists found that they could reduce the averaging calving age through adjustments in the mixture of forages and grains. Cutting a month off the calving age saved **Wisconsin** dairy farmers $18 million per year in reduced feed costs.

- **New test may save lives.** *Listeria* is one of the most dangerous foodborne pathogens. It kills about 30 percent of the estimated 1,800 people who get the illness each year in the United States. The pathogen is found in 3 percent to 5 percent of raw milk. Pasteurizing raw milk is critical in detroying this pathogen. However, research shows that while pathogenicity is reduced by pasteurization, the organism remains dangerous. **Penn State** researchers recently developed a new method that rapidly detects heat-injured *Listeria* in pasteurized milk. This will help ensure the safety of dairy products and the health of millions who consume these products.

- **Same taste, less fat. Ohio State** researchers found that homogenizing cream before making Swiss cheese allows the fat to be more evenly distributed throughout the cheese. This will allow cheese makers to produce a lower fat product with little loss in taste. **Ohio** leads the nation in Swiss cheese production, churning out 64 million pounds annually.

Cooperative State Research, Education, and Extension Service
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